OCR A Level Computer Science

Vision statement - Independent thinkers, creative programmers and resilient problem solvers.

Curriculum Intent – OCR A Level Computer Science

Our OCR A Level Computer Science curriculum is designed to develop independent, curious and resilient computational thinkers who understand how computer systems work and can apply computational thinking to solve complex problems. Students develop both the theoretical knowledge and practical programming skills required to understand an increasingly digital world, while being encouraged to question, investigate and evaluate the technologies that shape society.

The curriculum is carefully sequenced to build secure knowledge across the key areas of the OCR specification, including computer systems, processors, software development, data representation, networks, databases, web technologies, data structures, algorithms and computational thinking. Concepts are revisited and developed throughout the course, enabling students to make connections between topics and apply their knowledge confidently to increasingly complex problems.

Programming and problem solving are embedded throughout the curriculum. Students develop their ability to decompose problems, design algorithms, write and test programs, identify and correct errors, and evaluate the efficiency and suitability of different solutions. Regular programming practice develops confidence, resilience and independence, while encouraging students to approach unfamiliar problems logically and systematically.

Students also explore the wider ethical, legal, cultural and environmental implications of digital technology, considering the impact of developments such as artificial intelligence, automation, data collection, cybersecurity and emerging technologies. They are encouraged to engage critically with contemporary developments in computing and to construct balanced, evidence-based arguments rather than simply accepting technology at face value.

The Programming Project (NEA) provides students with an opportunity to apply their knowledge independently to a substantial problem of their own choosing. Students analyse a problem, identify and engage with stakeholders, design and develop a computational solution, test and refine their work and critically evaluate the finished product. This develops not only technical programming ability but also project management, research, communication, problem-solving and evaluative skills that are valuable in higher education and employment.

Retrieval practice, explicit teaching of technical terminology, regular programming challenges and examination practice are embedded throughout the course to ensure that knowledge is retained and can be applied accurately in unfamiliar contexts. Students are encouraged to explain their reasoning, use precise technical vocabulary and develop the extended responses required by the OCR examinations.

Beyond the specification, students are provided with opportunities to extend their computational thinking and experience challenge through enrichment activities such as the BEBRAS Computing Challenge and British Informatics Olympiad. These opportunities encourage students to tackle unfamiliar problems, develop algorithmic thinking and experience computing beyond the examination curriculum.

Ultimately, the curriculum aims to develop students who are technically knowledgeable, analytical, creative and independent, with the confidence to approach unfamiliar computational problems and the skills and curiosity to progress successfully into higher education, apprenticeships and careers within computing and the wider technology sector.

Why study Computer Science at The Sixth Form at Ridgewood?

- A level Computer Science is rapidly becoming one of the most sought after qualifications in the world and proves hugely popular with the best universities across the globe.
- Studying it at Ridgewood Sixth Form will provide you with the very best foundations for the beginning of your computer science journey, whether that's to progress to university, or jump straight into a career.
- At Ridgewood, we strive to ensure you will enjoy each and every lesson in Computing.
- A particular strength of the course at Ridgewood is the wealth of subject knowledge your teachers possess.
- With a team of highly qualified staff who teach parts of the course matching their speciality areas, you will receive outstanding tuition across all aspects of the course.

What topics will I study in this subject?

Topic	What this means
Unit 1 Computer Systems	This unit contains the most content and mainly looks at hardware and software. The topic also looks at different data types, data structures and algorithms, and legal, moral, cultural and ethical issues related to computers.
Unit 2 Algorithms and Programming	This unit is mainly about programming. It involves learning the different types of computational thinking and problem-solving methods and gives you an introduction into programming and learning and using algorithms to solve problems.
Unit 3 Programming Project	You will choose a computing problem to work through. You will analyse the possible solutions to the problem, design a solution, develop a solution and then evaluate your work.

What skills will I need in this subject?

Skill	What this skill involves in this subject
Problem solving	This could involve breaking down a complex problem into smaller problems or working out which algorithm to use to solve a problem.
Programming	You will be encouraged to learn new programming languages as well as engaging with your coding skills to undertake real world challenges to fully prepare you for the exams as well as industry careers.
Evaluation	You will need to see both sides of an argument and be able to suggest reasons why something might not happen the way it should.

What will my lessons involve?

- Half of lesson time will be focused on the two exam units. You will be tested in mock exams throughout the year to prepare you for these.
- During Year 13, a number of your lessons will be for you to work independently on your programming project.
- Most lessons involve explanation and discussion of a new concept, followed by practice questions on that concept.

- You will have lessons during Year 12 where you will be taught programming languages and more lessons practising these skills.

What will my independent study involve?

- You will be given regular work to do; this could involve researching an area or a new topic, or practice questions or mini projects
- You will need to spend considerable time checking over your notes to ensure you understand the content.
- During Year 13, you will need to spend most of your time working on your programming project. This will mostly be completed out of lesson, including the writing up of the four sections.
- Finally, you will need to spend time doing exam practice and becoming familiar with the mark schemes and questions.

How will I be assessed?

Percentage exam assessment: 80%	Percentage coursework assessment: 20%

Assessment	**Details of assessment**
Paper 1	2 hour 30 minute exam, 140 marks, 40% of overall mark Computer Systems Mostly short answer questions with some longer 9 and 12 mark questions
Paper 2	2 hour 30 minute exam, 140 marks, 40% of overall mark Algorithms and programming Mostly short answer questions with some longer 9 mark questions
Programming Project	Coursework, 70 marks, 20% of the exam Students will be expected to analyse a problem (10 marks), and design (15 marks), develop and test (25 marks), and evaluate and document (20 marks) a program. The program must be to solve it written in a suitable programming language.

How do I know this is the right course for me?

- If you have previously studied Computer Science, you will have a good idea of what you can expect at A level.
- The Computer Science A level is streamlined to directly develop what you have covered in Computer Science at GCSE.
- We will start by refreshing your knowledge of the basics of the GCSE content and ensuring you are confident, before delving deeper to cover the A level specification.
- If you are interested in programming or learning how to program, this course will be for you.
- If you enjoyed Computer Science at GCSE, and have an interest in developing your knowledge and understanding further, then A level Computer Science is absolutely for you.